

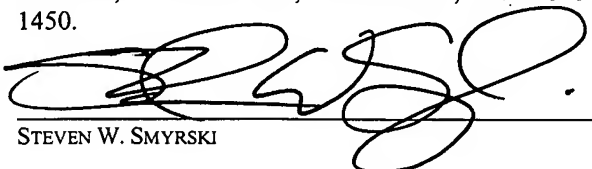


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PATENT
Atty Docket No. KLAC0076

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APPEAL BRIEF - PATENT, COMMISSIONER FOR
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1450.


STEVEN W. SMYRSKI

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

DAVID R. SHAFER, ET AL.

Title: CATADIOPTRIC IMAGING SYSTEM
FOR BROAD BAND MICROSCOPY

Serial No.: 10/646,073

Filed: August 22, 2003

Group Art Unit: 2872

Examiner: Lee A. Fineman

REPLY BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is in reply to the Examiner's Answer mailed November 2, 2007 in the above-
referenced application and associated appeal.

REMARKS

Appellants initially stress a few points made in Appellants' Brief for the purpose of highlighting the incorrect arguments being presented, in many cases for the first time, in the Examiner's Answer.

The paragraph [0096] passage of the Shafer 722 design does not (1) have alignment substantially along a single axis, nor (2) have a construction configured to balance aberrations between elements, where aberration balancing reduces decenter sensitivity of the elements of the design. The paragraph [0035] passage now being relied on simply represents a summary of designs similar to that discussed in paragraph [0096] and brings nothing to the discussion.

The paragraph [0096] passage of Shafer 722 states that decentering of any lens element in the design by 5 millimeters causes less than a quarter wave of coma, and use of element decenters and tilts can relax tolerances. This does not speak to a configuration to balance aberrations between elements, where being configured to balance aberrations reduces decenter sensitivity.

Such balancing of aberrations between, for example, catadioptric/Mangin elements and field lenses or focusing lenses is not shown by Shafer 722. These aspects of all the independent claims, as amended, including the axial alignment of elements and the elements being configured to balance aberrations to reduce decenter sensitivity, are missing from Shafer 722. Further, Yonekubo does not disclose nor suggest these aspects of the design. Yonekubo shows an immersion substance used in connection with microscopes. For these reasons, namely the absence of elements configured to balance aberrations to reduce decenter sensitivity and the fact that the Shafer 722 design does not have elements aligned substantially along an axis, the present claims are allowable.

Alignment "Substantially Along an Axis"

The Examiner's Answer, in the Response to Argument section (10) at page 8, argues that the paragraph [0035] passage of Shafer 722 demonstrates that the elements

are aligned substantially along a single axis, citing the phrase “uses a reflective lens mirror arrangement that has its optical axis mostly coincident with the optical axis of the major refraction components.”¹

Appellants, it should be pointed out, are the inventors of the Shafer 722 design and are extremely familiar with the Shafer 722 disclosure and designs. The paragraph [0035] passage of Shafer 722 is in the Summary of the Invention section of the Shafer 722 patent and the passage is employed to summarize the Detailed Description. As such, the paragraph [0035] passage cited in the Examiner’s Answer, like the paragraph [0097] passage, refers to a design similar or identical to the design of FIG. 7. The FIG. 7 design has similarities to the FIGs. 8 and 9 designs, and thus the passage [0035] summary is merely summarizing these FIGs. 7-9 designs. What is notable about these designs, FIGs. 7-9, is that **each design includes an off axis field lens: field lens 703, field lens 803, and field lenses 903 and 904 forming field lens arrangement 930.** All of these field lenses are off-axis, and are oriented at 90 degrees (approximately) to the axis on which the Mangin element is aligned. As such, none of these designs fits the claim limitation of “each focusing lens and each field lens is formed from a single glass material and *aligned substantially along an axis...*” The field lenses 703, 803, and 903-904 in these designs are aligned off-axis, and the summarization of these designs in the paragraph [0035] does not contradict the fact that these lenses represent an off-axis alignment.

The “Reducing Decenter Sensitivity” Limitation

The Examiner’s Answer further disputes the limitation of “said at least one field lens are configured to balance aberrations therebetween, said aberration balancing reducing decenter sensitivity of the Mangin mirror element...” (the “reducing decenter sensitivity limitation”) The Examiner’s Answer argues that the Shafer 722 design satisfies the reducing decenter sensitivity limitation by making the statement that:

“Increasing the tolerance is the same as reducing the sensitivity.”

¹ Appellants note that this paragraph [0035] argument was never made during prosecution, but is being

Examiner's Answer, p. 8.

This is wrong.

Increasing tolerances, (or, more specifically, “the tolerances become even more relaxed” in the actual wording of Shafer 722 paragraph [0096]), means that the lenses can be produced or manufactured using more relaxed machine tolerances, or the lenses can be produced with less care and at a lower cost than could have been done with other, stricter lens designs, while still producing satisfactory imaging results. This is a manufacturing statement, in other words, meaning that manufacturing requirements can be less and slightly poorer lenses can be employed with equally beneficial effects. In contrast, reducing decenter sensitivity is a different concept. In general, decenter sensitivity is the relationship between an amount of image vibration relative to an amount of movement encountered. A lensing arrangement configured to balance aberrations by reducing decenter sensitivity thus reduces the sensitivity of vibration or shaking relative to the movement encountered and can be highly beneficial, but is very different from relaxing tolerances, a manufacturing issue. Thus, again, the statement that “reducing decenter sensitivity” is the same as “relaxing tolerances” is flat out wrong.

More importantly, Appellants vehemently object to this argument being first introduced here on Appeal. Were this new argument raised earlier, Appellants would have had the opportunity, during prosecution or in Appellants' Brief, to introduce declarations and/or other evidence that “decenter sensitivity” is not “relaxing tolerances,” or evidence that the two are very different concepts. As this is Appellants' Reply Brief, and introduction of evidence is prohibited, *Appellants strenuously object to this argument* and, at the very least, ask that the present case be sent to reopen prosecution if not outright reversed. Such introduction of an entirely new line of reasoning is wholly improper and Appellants object to the introduction of a new argument at a point when evidence rebutting the argument cannot be introduced.

presented here on Appeal for the first time. Appellants object to this new argument being raised at this time, where Appellants have no ability to introduce evidence contradicting the assertion.

The Examiner's Answer further contends, in essence, that the reducing decenter sensitivity limitation is a functional limitation and thus the prior art performing the function satisfies the limitation. (Examiner's Answer, p. 8) Appellants respond by saying the limitation is specifically worded to state that the "at least one field lens *are configured to* balance aberrations therebetween, said aberration balancing reducing decenter sensitivity of the Mangin mirror element..." Appellants submit that the "configured to" language and the language of the "reducing decenter sensitivity" limitation are not functional limitations, but instead are physical limitations of the "at least one field lens," and cannot be ignored. Further, the Shafer 722 design does not operate to reduce decenter sensitivity. Once again, this argument was not raised during prosecution, is being introduced on Appeal, and Appellants object to its introduction at this time as improper.

Combination of References

Finally, Appellants continue to dispute the reasoning employed in combining the Shafer 722 and Yonekubo references. one cannot simply take elements from an existing objective having multiple axis alignment, straighten them out, and obtain any type of reasonable performance. The Shafer 722 design, for example, includes certain curved/Mangin elements along the optical path, and placing all elements along a single axis would not work for its intended purpose, nor produce any type of reasonable image. Similarly, simply placing an immersion substance in front of or somehow in cooperation with the Shafer 722 design would not operate in accordance with the intended purpose, namely imaging specimens. The images received would be less than optimal unless extensive experimentation occurred or alternately the present design were available and employed. Further, the specific configuration presented serves, as noted in the specification, to balance aberrations and reduce decenter sensitivity, aspects not achievable using Shafer 722 in combination with an immersion substance without a complete redesign after excessive experimentation.

The alchemy attempted in the Examiner's Answer requires fundamental changes to both Shafer 722 and Yonekubo that are not taught or disclosed in either reference and

would fundamentally change the teachings of each reference. Force of will alone is insufficient to meld Shafer 722 and Yonekubo.

Shafer 722 is a broad band DUV/VUV imaging system that does not employ an immersion substance, does not discuss an immersion substance, and does not illustrate an embodiment having field elements substantially aligned on an axis. Instead, Shafer 722 uses a mangin mirror element to provide substantially what may be termed a retro beam reflecting light energy back from the light energy received (see, e.g., FIG. 3). One critical issue is therefore the complete absence of an immersion substance from the Shafer 722 reference.

Yonekubo does not disclose nor suggest the unique properties associated with the present design, including but not limited to elements configured to balance aberrations to reduce decenter sensitivity, providing light energy having a wavelength in the range of approximately 157 nanometers through the infrared light range and focusing the light energy using at least one lens into focused light energy, where each lens used in said focusing has diameter less than approximately 100 millimeters. Yonekubo shows immersion substances used in microscopes, but does not indicate use with light energy having a wavelength in the range of approximately 157 nanometers through the infrared light range, use focusing lenses and field lenses as claimed, or disclose or suggest at least one Mangin mirror element having diameter less than 100 millimeters receiving light energy. It is as if an immersion substance was found in a random reference and assumed to be insertable wholesale into the Shafer 722 device. However, one could not simply place an immersion substance within the Shafer 722 design and obtain an objective design having the beneficial aspects presently claimed or operating with any level of adequate performance. In other words, the resultant device would yield a poor image and provide inadequate inspection capabilities in the environment claimed. Thus it is difficult, if not impossible, to argue that one would reasonably combine the design of Shafer 722 with the immersion substances of Yonekubo based on the disclosure of the references themselves.

The references have been combined using hindsight, which is improper. The Examiner's Answer uses hindsight reasoning in fashioning the combination of Yonekubo and Shafer 722, in an effort to deprecate the present claims, and the Examiner's Answer presents no reasons having rational underpinnings in support of the combination. The reasoning presented, again, is tantamount to saying one would be motivated to combine A with B because then you could have A and B, which is better than just A. This is not a reason to combine, but a desired end result gleaned from Appellants' claims and the use of hindsight.

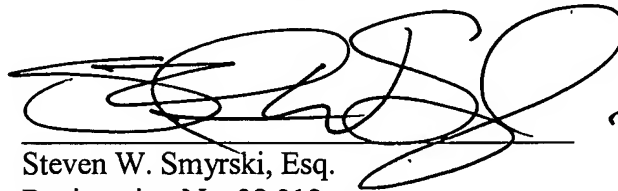
Accordingly, it is respectfully submitted that all pending claims fully comply with 35 U.S.C. § 103.

CONCLUSION

In view of the foregoing, Appellants submit that all pending claims are patentably distinct over the prior art and are allowable. Thus the Final Office Action rejecting all pending claims is in error and should be reversed.

Appellants believe that no fees are due in accordance with this Reply Brief beyond those included herewith. Should any additional fees be due or overpayment made, the Commissioner is hereby authorized to charge any deficiencies or credit any overpayment to Deposit Account 502026.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Smyrski', written over a horizontal line.

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Date: January 2, 2008

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